REMARKS

In the Office Action dated October 13, 2004, claims 13-14, 16-17, 24-27 and 30-39 are pending and under consideration. Claims 24-27 and 35-36 are rejected under 35 U.S.C. §112, first paragraph, as allegedly containing subject matter not described in the specification. Claims 17, 30 and the claims dependent therefrom are rejected under 35 U.S.C. §112, first paragraph, as allegedly containing subject matter not described in the specification. Claim 39 is rejected under 35 U.S.C. §112, first paragraph, as allegedly containing subject matter not described in the specification. Claims 13, 16-17, 24-27 and 30-39 are rejected under 35 U.S.C. §102(b) as anticipated by, or in the alternative, under 35 U.S.C. §103(a) as unpatentable over Frantz et al. (U.S. 5,695,769), as evidenced by Barenholz et al. (U.S. 6,156,337). Claims 13, 16-17, 24-27 and 30-39 are rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite.

This Response addresses each of the Examiner's rejection. Applicants therefore respectfully submit that the present application is in condition for allowance. Favorable consideration of all pending claims is therefore respectfully requested.

Claims 24-27 and 35-36 are rejected under 35 U.S.C. §112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention. The Examiner indicates that this is a new matter rejection.

Specifically, the Examiner alleges that there appears to be no descriptive support in the specification for the recitations: "stabilizing agent is aluminum hydroxide" in Claims 24, 26 and 35, and "said stabilizing agent, aluminum hydroxide, is added...to a final concentration of 30% v/v" in Claims 25, 27 and 36. The Examiner states that throughout the specification, the

stabilizing agent that is supported and that is added to a final concentration of 30% v/v is "aluminum hydroxide gel", but not "aluminum hydroxide", as presently recited in the instant claims.

Applicants respectfully disagree with the Examiner. Applicants respectfully submit that the claimed subject matter need not be described literally or "in haec verba" in order to satisfy the written description requirement. *In re Lukach*, 442 F.2d 967, 969, 169 USPQ 795 (CCPA 1971); *Fujikawa v. Wattanasin*, 93 F.3d 1559, 1570, 39 USPQ 2d 1895, 1904 (Fed. Cir. 1996). It is sufficient to clearly convey to those skilled in the art that the inventors had possession of the claimed subject matter at the time the application was filed.

More specifically, the application, as originally filed, describes "metal hydroxide" as a stabilizing agent. See original claim 2. *Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 938, 15 USPQ 2d 1321, 1326 (Fed. Cir. 1990) (holding that the original claims are part of the patent specification). The application also clearly describes that aluminum hydroxide gel is simply one of the stabilizing agents appropriate for use in the claimed compositions. See page 6, lines 29-34 of the specification. It was abundantly clear to those skilled in the art, at the time the present application was filed, that aluminum hydroxide gel is one form of aluminum hydroxide, which is an example of metal hydroxide. Thus, Applicants respectfully submit that the entire disclosure of the application certainly conveys to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention with respect to "aluminum hydroxide" as a stabilizing agent. Furthermore, the specification, by way of its examples, illustrates that a stabilizing agent, such as a metal hydroxide gel, e.g., aluminum hydroxide gel, can be added to a final concentration of 10%-40% v/v, preferably 30% v/v. See page 7, lines 1-6 of the specification. Thus, Applicants respectfully submit that given the entire

disclosure of the application, one skilled in the art would understand that the inventors, at the time the application was filed, had possession of the claimed invention with respect to a stabilizing agent, such as "aluminum hydroxide", to a final concentration of 30% v/v.

Applicants further respectfully submit that claims 35-36 have been canceled without prejudice. Applicants have also amended claims 24-27 to recite "aluminum hydroxide gel", solely to describe certain preferred embodiments of the claimed invention, without acquiescing to the Examiner's contention. It should be noted that independent claims 13 and 17 recite "metal hydroxide", which, as discussed above, includes aluminum hydroxide in any event.

In view of the foregoing, Applicants respectfully submit that the rejection of claims 24-27 and 35-36 under 35 U.S.C. §112, first paragraph, as allegedly containing new subject matter not described in the specification, is overcome. Withdrawal of the rejection is therefore respectfully requested.

Claims 17, 30 and the claims dependent therefrom are rejected under 35 U.S.C. §112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention. The Examiner indicates that this is a new matter rejection.

Specifically, the Examiner objects to the recitation "about 8% v/v of an amphiphilic surfactant" in claims 17 and 30. The Examiner alleges that the descriptive support at lines 26 and 27 on page 7 of the specification is limited to "an amphiphilic surfactant at from about 1.5% to about 6% v/v".

Applicants respectfully submit that the specification describes a preferred adjuvant which contains "about 8% surfactant (e.g., about 5.6% v/v Tween 80 and about 2.4% v/v Span

80)". See page 3, line 32 to page 4, line 2 of the specification. As disclosed in the specification and understood by those skilled in the art, Tween 80 and Span 80 are both examples of an amphiphilic surfactant. See page 7, lines 28-29 of the specification.

Accordingly, it is respectfully submitted that claims 17, 30 and their dependent claims are adequately described in the specification in compliance with the written description requirement. Withdrawal of the rejection of these claims under 35 U.S.C. §112, first paragraph, is therefore respectfully requested.

Claim 39 is rejected under 35 U.S.C. §112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention. The Examiner indicates that this is a new matter rejection.

In an effort to favorably advance prosecution of the present application, claims 34-39 have been canceled without prejudice, rendering the instant rejection moot. Applicants reserve the right to pursue the subject matter of the canceled claims in a continuation application. Accordingly, withdrawal of the rejection of claim 39 under 35 U.S.C. §112, first paragraph, is respectfully requested.

Claims 13, 16-17, 24-27 and 30-39 are rejected under 35 U.S.C. §102(b) as anticipated by, or in the alternative, under 35 U.S.C. §103(a) as unpatentable over Frantz et al. (U.S. 5,695,769), as evidenced by Barenholz et al. (U.S. 6,156,337).

Independent claim 13 is directed to an antigenic composition wherein the *Erysipelothrix rhusiopathiae* fluid fraction is inactivated with beta-propiolactone (BPL). Applicants previously argued that Frantz et al. only disclose the preparation of a fluid fraction of an *Erysipelothrix rhusiopathiae* culture, inactivated by formalin, and that Frantz et al. do not

teach or suggest inactivating the *Erysipelothrix rhusiopathiae* fluid fraction with BPL.

The Examiner argues that Frantz et al. do not have to teach a BPL-inactivated "fluid fraction" of *Erysipelothrix rhusiopathiae*, because the claim requires the *Erysipelothrix rhusiopathiae* culture, as opposed to the fluid fraction, to be inactivated with BPL.

Applicants have amended claim 13 to clarify that the antigenic composition comprises a fluid fraction of an *Erysipelothrix rhusiopathiae* culture, wherein the *Erysipelothrix rhusiopathiae* culture is inactivated with BPL. Applicants respectfully submit that Frantz et al. do not teach or suggest inactivating an *Erysipelothrix rhusiopathiae* culture with BPL, much less a fluid fraction of a BPL-inactivated *Erysipelothrix rhusiopathiae* culture.

The Examiner maintains that Frantz et al. suggest that BPL can be used as an inactivating agent. However, the passing mention of BPL as an inactivating agent in Frantz et al. are understood to be applicable to inactivation of *P. multocida* (col. 6, line 12) and *B. bronchiseptica*. Where inactivation of *Erysipelothrix rhusiopathiae* is involved (col. 16-17 of Frantz et al.), only formalin is disclosed as the inactivating agent.

The Examiner further argues that the limitation, "inactivated with beta-propiolactone", is a process limitation in a product claim, and therefore the claimed products are still not distinguished from the product disclosed by Frantz et al.

In response, Applicants respectfully submit that it is believed that the *Erysipelothrix rhusiopathiae* culture inactivated by formalin and the fluid fraction of the inactivated culture, as disclosed by Frantz et al., are not the same as the *Erysipelothrix rhusiopathiae* culture inactivated by BPL and the fluid fraction obtained therefrom, as presently claimed. Applicants respectfully submit that inactivation of cells with formalin is known to be achieved by cross-linking of proteins. In contrast, BPL is known to alkylate nucleic acids to achieve inactivation. As

supporting evidence, Applicants provide herewith two articles: Groseil (*Biologicals* 23: 213-220, 1995) and Bahnemann (*Vaccine* 8: 299-303, 1990), attached hereto as **Exhibits 1** and **2**. As a result of different inactivation mechanisms, a BPL-inactivated *Erysipelothrix rhusiopathiae* culture and a fluid fraction thereof, are *structurally* different from formalin-inactivated culture and a fluid fraction thereof, respectively, at least in respect to the DNA and protein/antigen components.

Consistent with Applicant's position that a formalin-inactivated antigen preparation is structurally different from a BPL-inactivated antigen preparation, the present specification discloses that formalin inactivation decreased the ELISA assay value of the 64kD and 66kD proteins in the culture filtrate of *Erysipelothrix rhusiopathiae*, whereas BPL inactivated culture had an ELISA assay value about 4 times that of the formalin concentrate. See page 11, lines 29-31 of the specification. Additionally, the antigenic components of an *Erysipelothrix rhusiopathiae* culture inactivated by BPL appear to have different stability features as compared to those of a formalin-inactivated culture. See page 11, lines 31-32 of the specification.

The Examiner has further argued that the instant invention, if not anticipated by the prior art would have been *prima facie* obvious over the prior art. The Examiner contends that Frantz et al. expressly taught that other inactivating agents, such as BPL, may be used as an alternative inactivating agent. Thus, the Examiner concludes that it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to inactivate Frantz's *Erysipelothrix rhusiopathiae* culture with BPL to produce the claimed antigen composition and the vaccine.

As submitted above, Frantz et al. do not specifically teach or suggest inactivating that an *Erysipelothrix rhusiopathiae* culture with BPL. Additionally, as submitted above, a formalin-

inactivated *Erysipelothrix rhusiopathiae* preparation and a BPL-inactivated *Erysipelothrix rhusiopathiae* preparation are structurally different and have different stability characteristics. Those skilled in the art would not have reasonably expected that a BPL-inactivated fluid fraction of *Erysipelothrix rhusiopathiae* would have a sufficient immunoprotective effect.

Therefore, Applicants respectfully submit that the subject matter presently claimed in claim 13 and its dependent claims, which involves BPL-inactivation of an *Erysipelothrix rhusiopathiae* culture, is not anticipated or rendered obvious Frantz et al.

With respect to claims 17, 30 and their dependent claims, these claims are directed to vaccine compositions comprising a fluid fraction of an inactivated *Erysipelothrix rhusiopathiae* culture and a stabilizing agent, wherein the inactivation agent is not limited to any specific agent. The vaccines are required to include an adjuvant, which contains about 2% v/v lecithin, about 18% v/v mineral oil, and about 8% v/v of an amphiphilic surfactant, with the remaining volume being a saline solution.

Applicants respectfully submit that Frantz et al. do not teach an *Erysipelothrix rhusiopathiae* vaccine that confers protection against *Erysipelothrix rhusiopathiae* infection. Applicants observe that Frantz et al. disclose the preparation of a fluid fraction of an inactivated *Erysipelothrix rhusiopathiae* culture, in which aluminum hydroxide was added to a final concentration of 25%. However, this preparation disclosed by Frantz et al. was never applied to any animals to test its efficacy of protection. In fact, Frantz et al. only included 0.3 ml of this *Erysipelothrix rhusiopathiae* preparation in a *P. multocida* vaccine of a total of 2 ml dose (see col. 17, line 34 of Frantz et al.). The Examiner has alleged that Frantz et al. disclose that the *Erysipelothrix rhusiopathiae* –containing vaccine induced best immunity in swine (Example 11). However, it is the combination vaccine that was administered to swine in Frantz et al., and the

alleged protection observed by Frantz et al. was directed towards *P. multocida*, as measured by levels of antibodies against *P. multocida* toxins in the vaccinated animals. There is no showing in Frantz et al. that the vaccine has any efficacy in protecting immunized animals against *Erysipelothrix rhusiopathiae*.

Therefore, Applicants respectfully submit that Frantz et al. do no teach a vaccine composition that confers protection against *Erysipelothrix rhusiopathiae*. To highlight the distinguishing features of the present invention, Applicants have amended claims 17 and 30 to add "wherein said vaccine composition protects an animal against *E. rhusiopathiae* infection".

Applicants further respectfully submit that Frantz et al. do not teach a vaccine composition containing an inactivated *Erysipelothrix rhusiopathiae* fluid fraction with the specific adjuvant as presently claimed, i.e., an adjuvant with the specific amounts of specified ingredients as recited. As shown in the present specification, such a vaccine is stable and confers effective protection for an extended period of time. See page 21 of the specification. The long-term protection conferred by such a vaccine is unexpected, as a vaccine containing an inactivated *Erysipelothrix rhusiopathiae* fluid fraction in combination with a different adjuvant, e.g., saponin, did not provide protection for the same period of time, as admitted by the Examiner.

Moreover, Applicants respectfully submit that where specific teaching is lacking in Frantz et al. for the vaccine composition as claimed, there is no basis for the Examiner to conclude that the vaccine composition disclosed by Frantz et al. inherently possesses the superior properties of the claimed vaccine composition.

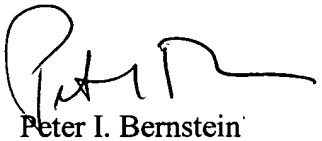
In view of the foregoing, it is respectfully submitted that the claims, as presently amended, are not anticipated or rendered obvious by Frantz et al. Withdrawal of the rejection based on Frantz et al. is therefore respectfully requested.

Claims 13, 16-17, 24-27 and 30-39 are rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite.

It is respectfully submitted that the claims, as presently amended, are not indefinite. Withdrawal of the rejection is therefore respectfully requested.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is condition for allowance, which action is earnestly solicited.

Respectfully submitted,



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Enc.: Exhibits 1-2